

### west virginia department of environmental protection

Office of Oil and Gas 601 57th Street SE Charleston, WV 25304 (304) 926-0450 (304) 926-0452 fax Earl Ray Tomblin, Governor Randy C. Huffman, Cabinet Secretary www.dep.wv.gov

March 18, 2015

### WELL WORK PERMIT Horizontal 6A Well

This permit, API Well Number: 47-6101704, issued to NORTHEAST NATURAL ENERGY LLC, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin

Chief

Operator's Well No: KASSAY 3H

Farm Name: KASSAY, NEHEMIAH & PATTY A

API Well Number: 47-6101704

Permit Type: Horizontal 6A Well

Date Issued: 03/18/2015

Promoting a healthy environment.

API Number:	61-01704

### PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. <u>Failure to adhere to the specified permit</u> conditions may result in enforcement action.

#### CONDITIONS

- 1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
- 2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
- 3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
- 4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
- 5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
- 6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
- 7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
- 8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
- Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well.
   Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

WW-6B (9/13)

# STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS WELL WORK PERMIT APPLICATION

		Vo	1 3	256
1) Well Operator: Northeast Natural Energ	y LLC 494498			Blacksville
	Operato	r ID County	District	Quadrangle
2) Operator's Well Number: Kassay 3H		Well Pad Name: K	assay	
3) Farm Name/Surface Owner: Nehemiah and	Patty A. Kassay Pu	blic Road Access:	County Route 25	5/3 (Yank Hollow Road)
4) Elevation, current ground: 1,559'	Elevation, pr	oposed post-const	ruction: 1535'	
5) Well Type (a) Gas	Oil	_ Underground S	torage	
Other		3		
(b)If Gas Shallow	I	Deep		-
Horizontal		MgK 12	117/2014	
5) Existing Pad: Yes or No No				
7) Proposed Target Formation(s), Depth(s), Marcellus; 8,248'; 115', 3,580 psi	Anticipated Thi	ckness and Associa	ated Pressure(s	);
8) Proposed Total Vertical Depth: 8,248				
9) Formation at Total Vertical Depth: Mar	cellus			-
10) Proposed Total Measured Depth: 16,3	338'			
11) Proposed Horizontal Leg Length: 7,74	19.87'			
12) Approximate Fresh Water Strata Depth	s: 65', 1,30	)'		
13) Method to Determine Fresh Water Dep	ths: Driller's Log	from Offset Wells		
14) Approximate Saltwater Depths: 1,450	)' , 2,100'			
15) Approximate Coal Seam Depths: 700'	, 1,252'			
16) Approximate Depth to Possible Void (c	oal mine, karst,	other): N/A		
17) Does Proposed well location contain co directly overlying or adjacent to an active n			No 🗸	
(a) If Yes, provide Mine Info: Name:				
Depth:				
Seam:		, n	ECEIVED	
Owner:		Office	of Oil and G	ias
		Ollios	67.1	

DEC 29 2014

WV Department of Environmental Protection 03/20/2015

WW-6B (9/13)

### 18)

### CASING AND TUBING PROGRAM

TYPE	Size	New	Grade	Weight per ft.	FOOTAGE: For	INTERVALS:	CEMENT:
		or Used		(lb/ft)	Drilling	Left in Well	Fill-up (Cu. Ft.)
Conductor	24"	New	NA	94.71	60'	60'	GTS
Fresh Water	13-3/8"	New	J-55	54.5	1,430'	1,400'	CTS
Coal							
Intermediate	9-5/8"	New	J-55	40	2,330'	2,300'	CTS
Production	5-1/2"	New	P-110	20	16,338'	16,308'	3,819 Cu. Ft.
Tubing	2-7/8"	New	N-80	6.5	NA	8,500'	NA
Liners							

MgK 12/12/2014

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	24"	30"	.375	415	4,500 psi Grout	NA
Fresh Water	13-3/8"	17 1/2"	.38"	2,760	Class A	1.23
Coal						
Intermediate	9-5/8"	12 1/4"	.395"	3,950	Class A	1.3
Production	5-1/2"	8 3/4"	.361"	12,530	50:50 Poz	1.21
Tubing	2-7/8"	NA	.217"	10,570	NA	NA
Liners						

### **PACKERS**

Kind:	
Sizes:	
Depths Set:	RECEIVED

Office of Oil and Gas

DEC 29 2014

WV Department of Environmental Protection Page 2 of 3 03/20/2015

WW-6B (9/13)

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:
Drilling and completion of a horizontal Marcellus well. The well will be drilled on air to an approximate depth of 7,200' TVD/MD. The well will then be horizontally drilled on fluid from the KOP to approximately 8,248' TVD / 16,338' MD along a 324 degree azimuth.
20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:
Multi-stage / high-rate slickwater fracture treatment using various size sands as proppant. First stage will be initiated via pressurization against a burst disc ran in the production casing string or perforated with coiled tubing. Subsequent stages will be perforated with pumped down guns ran on wireline. Individual stages will be isolated with composite frac plugs. Maximum pump rate during any stage will be 110 BPM with a maximum allowable surface pressure of 9,500 PSI. Composite bridge plugs will be set at the end of the last stage to isolate the treated formation.
21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 15.85
22) Area to be disturbed for well pad only, less access road (acres): 13.00
23) Describe centralizer placement for each casing string:
Surface and intermediate casing strings will have bow spring centralizers placed every third joint (~120') from the shoe joint to surface. Production casing will have rigid body centralizers placed at a minimum of every fourth joint (~160') from TD to surface.
24) Describe all cement additives associated with each cement type:
Surface string cement will be a Class A + Max 3% bwoc Calcium Chloride Fresh Water blend. Intermediate string cement will be a Class A Cement + Max 3% bwoc Calcium Chloride + Fresh Water. Production string cement will be (50:50) Poz (Fly Ash):Type I Cement with a gas migration additive.
25) Proposed borehole conditioning procedures:
Surface string will use a 25.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Intermediate string will use a 25.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl

Bentonite @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Production string will use a 50.0 bbls SealBond 25 + 1 gal/bbl US-40 + 275 lbs/bbl Barite + 1 gal/bbl SS-2 Spacer @ 13.5 ppg prior to cement.

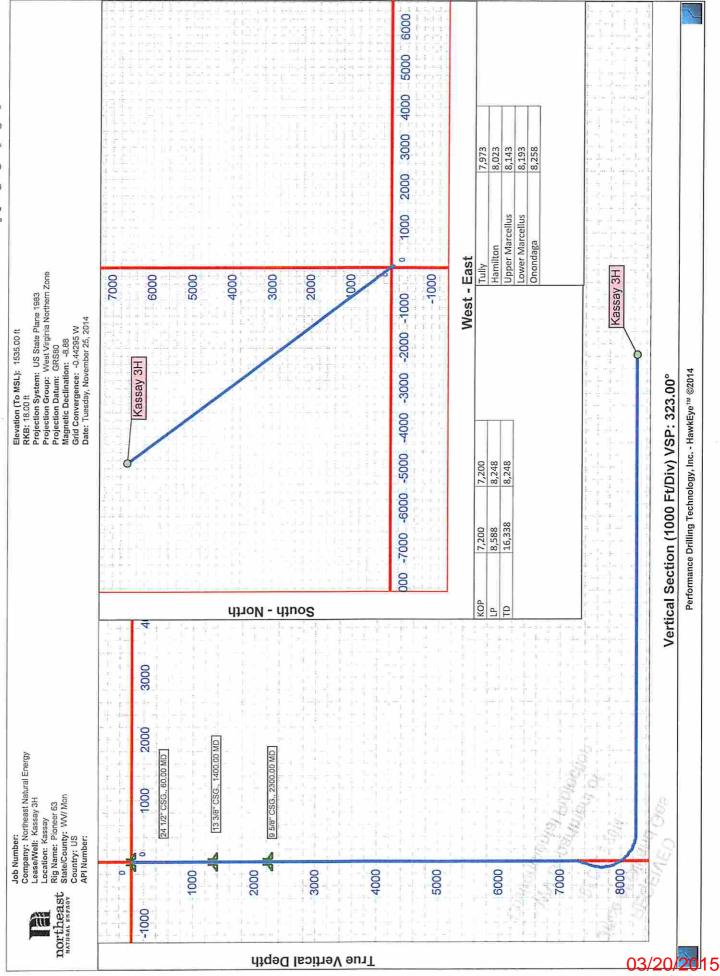
gal/bbl US-40 + 275 lbs/bbl Barite + 1 gal/bbl SS-2 Spacer @ 13.5 ppg prior to cement.

DEC 29 2014

Office of Oil and Gas

\*Note: Attach additional sheets as needed.

WV Department of



### 4706101704

API Number 47 -	
Operator's W	ell No. Kassay 3H

## STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION OFFICE OF OIL AND GAS

#### FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name_Northeast Natural Energy LLC OP Cod	e
Watershed (HUC 10) Dunkard Creek Quadrangle Blacksville	, WV
Elevation 1559 County Monongalia Distric	ctClay
Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Will a pit be used? Yes No	Yes No No
If so, please describe anticipated pit waste:	
Will a synthetic liner be used in the pit? Yes No If so, what m	1.?
Proposed Disposal Method For Treated Pit Wastes:	
Land Application	
Underground Injection (UIC Permit Number	)
Reuse (at API Number_unknown at this time, TBD  Off Site Disposal (Supply form WW-9 for disposal location)	)
Other (Explain_	
Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil base	d, etc. Air - Vertical/Oil Based-Curve & Horizontal
-If oil based, what type? Synthetic, petroleum, etc. Synthetic Oil Based Mud	
Additives to be used in drilling medium? Organophilic Clay Viscosifiers, Lime, Unsaturated Fatty Acids, CaCl, Ba	rite, Emulsifiers, Mica LCM, Water Loss Agents
Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Removed Offsite - S	
-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdu	st)
-Landfill or offsite name/permit number?See Attachment A	
I certify that I understand and agree to the terms and conditions of the GENERAL on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environ provisions of the permit are enforceable by law. Violations of any term or condition of the law or regulation can lead to enforcement action.  I certify under penalty of law that I have personally examined and am familiar application form and all attachments thereto and that, based on my inquiry of those is obtaining the information, I believe that the information is true, accurate, and complete penalties for submitting false information, including the possibility of fine or imprisonment.	with the information and that the with the information and the sindividual flow of an aware that there are significant
Company Official Signature	WV Department of
Company Official (Typed Name) Hollie Medley	Environmental Protection
Company Official Title Regulatory Coordinator	
Subscribed and sworn before me this the day of December  My commission expires April 11, 7017	OFFICIAL SEAL Andrew J. Travis Notary Public State of West Virginia My Commission Expires April 6240 Mid 10 10 10 10 10 10 10 10 10 10 10 10 10

Form WW-9	Operator's Well No	Kassay 3H
Northeast Natural Energy LLC	operator's well be	<u> </u>
Proposed Revegetation Treatment: Acres Disturbed		5-8.0
Fertilizer amount 500	lbs/acre	
Mulch 3	Tons/acre	
	Seed Mixtures	
Temporary	Permanent	
Seed Type Ibs/acre Kentucky Blugrass 20	Seed Type Kentucky Bluegrass	lbs/acre 20
Red Top 20	Red Top	20
Common White Clover 15	Common White Clover	15
Drawing(s) of road, location, pit and proposed area for provided)  Photocopied section of involved 7.5' topographic sheet  Plan Approved by:  Comments:	i.	
Title: Thipeetor	W	RECEIVED ce of Oil and Gas DEC 2 9 2014 / Department of onmental Protection
Field Reviewed? ( × ) Yes		

### Attachment A to WW-9

Northeast Natural Energy LLC ("NNE") plans to utilize a closed loop process for its drilling of the Kassay 3H well. Return flow from the well will be separated into its liquid and solid form. Liquids will be held in steel tanks and reused in the drilling and completion process or disposed of at an approved facility listed below. Solids removed from the stream will be diverted to steel half-round tanks where they will be solidified on site and taken to disposal as they are accumulated.

Kassay 3H Drill Cuttings will be taken to disposal at one or more of the following disposal/approved waste facilities, unless listed facilities are no longer approved to accept waste at time of disposal:

- Westmoreland Landfill (Tervita) Belle Vernon, PA (Permit # 100277)
- Meadowfill Landfill (Waste Management) Bridgeport, WV (Permit # SWF 103298)
- Max Environmental Yukon, PA (PAD004835146 and 301071)
- Max Environmental Bulger, PA (PAD059087072 and 301359)
- Chestnut Valley Landfill (Advanced Disposal) Export, PA (Permit # 101421)

NNE plans to reuse and recycle all flowback fluid and/or reach out to other operators in the area who may be able to reuse and recycle such fluid. However, in the event that reuse is not obtainable the fluid will be disposed of at one, or multiple, of the following disposal/approved waste facilities unless listed facilities are no longer approved to accept waste at time of disposal:

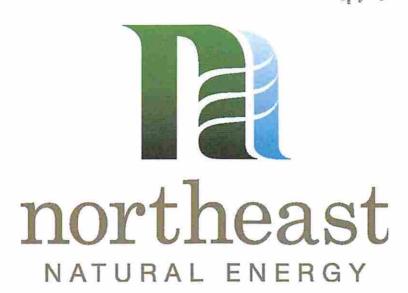
- Fairmont Brine Processing (WV NPDES #0116408)
- Green Hunter M. E. Elder 1 Disposal Well (Permit # 47-085-05151)
- Green Hunter Mason 1 Disposal Well (Permit #47-085-09721)
- Green Hunter Warren Disposal Well (Permit #34-121-2-3995)
- Green Hunter Travis Unit Disposal Well (Permit #34-121-2-4086)
- Viking Energy Corporation 20320 Disposal Well (Permit#47-039-02210)
- Ohio Oil Gathering Killbuck Disposal Well (Permit #34-075-24527)
- Ohio Oil Gathering Moran Disposal Well (Permit #34-089-24792)
- Ohio Oil Gathering Bells Run Disposal Well (Permit #34-167-29395)
- Ohio Oil Gathering Long Run Disposal Well (Permit #34-167-29658)
- Ohio Oil Gathering Newell Run Disposal Well (Permit #34-167-29685)
- Appalachian Oil Purchaser Greens Run Disposal Well (Permit #20073 2504 Fronmental Protection)

• Appalachian Oil Purchaser BW#4 Disposal Well (Permit # 2D0732523)

RECEIVED Office of Oil and Gas

DEC 29 2014

WV Department of



Haller

## Kassay 3H SITE SAFETY PLAN

December 1, 2014

RECEIVED
Office of Oil and Gas

DEC 29 2014

WV Department of Environmental Protection

### 4706101704

SITE NAME Kassay 3H
COUNTY Monongalia
ACCESS ROAD ENTRANCE N39° 39' 23.7", W-80° 11' 54.49 (NAD 83)
N 4389949 4 E 568760 3 (NAD 83 LITM)

#### **DIRECTIONS TO SITE:**

From I-79, take exit 155. Merge onto Chaplin Hill Road/CR-19/24N toward US-19/WV-7/Star City. If traveling from the south, this will be a right off the exit. If traveling from the north, this will be a left off the exit. After approximately 0.8 miles, turn left at light onto US-19/WV-7. Continue on US-19/WV-7 for approximately 1.7 miles. Turn left on WV-7 and continue on route for approximately 8.3 miles, then turn left on Pedlar Run Road for approximately 0.6 miles. Take a right onto CR-37/1/Jessel Tennet Hill/Pedlar Run Road for approximately 2.1 miles, continue onto Long Drain Road for approximately 0.1 mile and turn left onto Mooresville Road for approximately 0.3 Miles. Turn Left onto Jakes Run Road for approximately 6.2 miles, then turn right onto Statler Run Road for approximately 0.6 miles. Turn right onto Country Road for approximately 1.2 miles. The Kassay Pad Access Road Entrance will be on the right.

Or, take exit 155. Merge onto Chaplin Hill Road/CR-19/24N toward US-19/WV-7/Star City. If traveling from the south, this will be a right off the exit. If traveling from the north, this will be a left off the exit. After approximately 0.8 miles, turn left at light onto US-19/WV-7. Continue on US-19/WV-7 for approximately 1.7 miles. Turn left on WV-7 and continue on route for approximately 13.9 miles, then take a slight left onto WV-218 S/Daybrook Run Road for approximately 5.9 miles. Turn left onto Yank Hollow Road for approximately 1 mile and the Kassay Pad Access Entrance will be on the left.

**From Blacksville**, take WV-218 S/Daybrook Run Road for approximately 5.9 miles, then turn left onto Yank Hollow Road for approximately 1 mile. The Kassay Pad Access Road Entrance will be on the left.

\*See Attached Maps

RECEIVED
Office of Oil and Gas

DEC 29 2014

WV Department of Environmental Protection 03/20/2015

